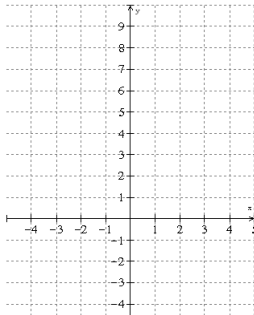


(1.5) Equivalent Linear Systems
(1.7) Exploring Linear Systems

Solutions by Graphing

Example 1: Graph $y = 3x$ and $2x + y = 10$ on the grid below and determine the solution.

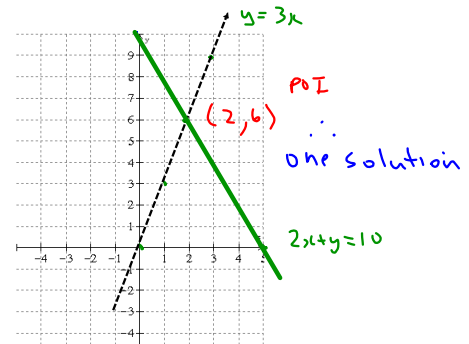


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(1.5) Equivalent Linear Systems
(1.7) Exploring Linear Systems

Solutions by Graphing

Example 1: Graph $y = 3x$ and $2x + y = 10$ on the grid below and determine the solution.



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Solutions by Equivalent Fractions

When you multiply one or more equations of a linear system by a constant other than 0, you create an equivalent linear system that has the same solution as the original system.

Also, when you add and subtract a linear system, the resulting system has the same solution as the original system.

Technique #1

i.e. Discuss to solve

$$\begin{array}{rcl} 2x - 5y & = & 20 \quad (1) \\ 3x + 4y & = & 24 \quad (2) \end{array}$$

substitution
 $-5y : -2x + 20$
 $\rightarrow -\frac{5}{4}y = -\frac{2}{3}x + \frac{20}{3}$
 $y = +\frac{2}{5}x - 4$

-compare slopes and y intercepts

Now, multiply the first equation by 4 and the second equation by 5 and graph the resulting system to find the new solution. Technique #2

$$\begin{array}{rcl} 4(2x - 5y) & = & 4(20) \Rightarrow 8x - 20y = 80 \\ 5(3x + 4y) & = & 5(24) \Rightarrow 15x + 20y = 120 \end{array}$$

Now, add and subtract the two equations to determine a new linear system and graph this system to find the new solution.

$$\begin{array}{rcl} 8x - 20y & = & 80 \\ + 15x + 20y & = & 120 \\ \hline 23x & = & 200 \end{array}$$

$$x = \frac{200}{23}$$

one sol'n

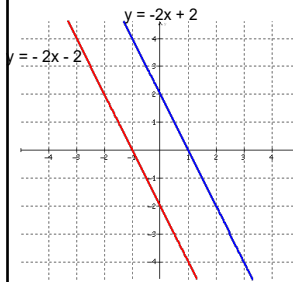
What do you notice?

Coefficient in front of y
is the same

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Linear systems can only have one solution, zero solutions or infinite solutions.

What do you notice about these linear systems?



Graphically: _____

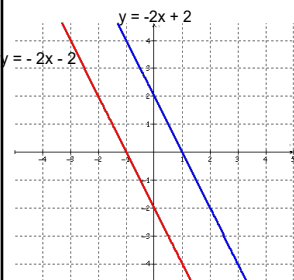
Algebraically: _____

Number of solutions: _____

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Linear systems can only have one solution, zero solutions or infinite solutions.

What do you notice about these linear systems?



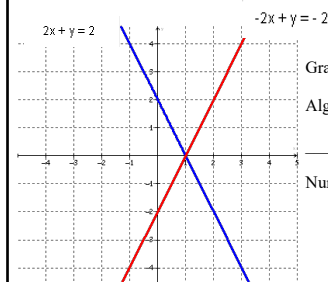
Graphically: 0 intercepts

Algebraically: _____

Number of solutions: 0

parallel lines - same slope
different y intercepts

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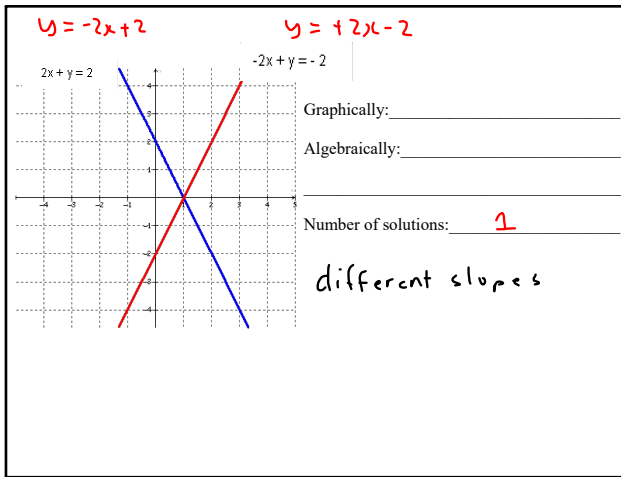


Graphically: _____

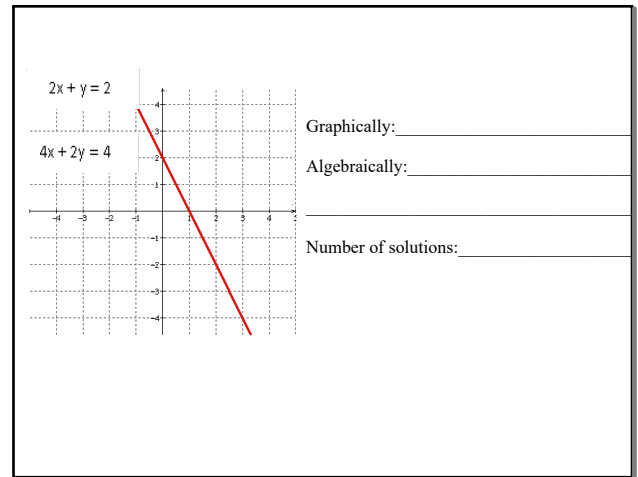
Algebraically: _____

Number of solutions: _____

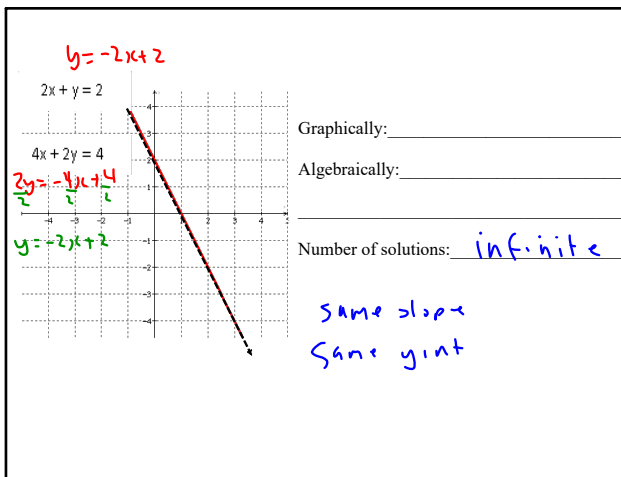
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Feb 15-8:20 PM



Feb 15-8:20 PM

1.7 EXIT Card

Answer the following questions

- The solution to a linear system with the same slope and same y intercepts is _____
- The solution to a linear system with the same slope but different y intercepts is _____
- In order for a linear system to have one ordered pair as a solution, the lines must have _____ slopes and _____ y intercepts.
- Without solving, determine the number of solutions to the linear system
 $3x + 4y = 12$
 $48 - 16y = 12$
- Given the line $x - 2y = 8$ write a second equation to form a linear system with
 - infinitely many solutions _____
 - no solutions _____
 - one solution _____

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1.7 EXIT Card

Answer the following questions

- The solution to a linear system with the same slope and same y intercepts is infinite
- The solution to a linear system with the same slope but different y intercepts is zero
- In order for a linear system to have one ordered pair as a solution, the lines must have different slopes and different/same y intercepts.
- Without solving, determine the number of solutions to the linear system
 $3x + 4y = 12$
 $48 - 16y = 12$
 $-12x - 16y = -48$
 $4y = -3x + 12$
 $y = -\frac{3}{4}x + 3$
(infinite)
- Given the line $x - 2y = 8$ write a second equation to form a linear system with
 - infinitely many solutions $2x - 4y = 16$ (same slope, different yint)
 - no solutions $y = \frac{1}{2}x + 6$ (different slope, different yint)
 - one solution $y = 2x + 4$ (different)

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Homework

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Test Tuesday

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